Technical description

Overview

SITRANS P320/P420 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameter assignment is performed using input buttons or the HART interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very user-friendly in spite of the numerous setting options.

Due to their advanced diagnostic functionalities according to NAMUR NE107, the SITRANS P320/P420 pressure transmitters are very suitable for use in chemical plants. Thanks to the advanced diagnostic functions and the process value storage, the SITRANS P420 is "Ready for Digitalization".

The "Remote Safety Handling" function saves customers significant amounts of time and money, because the SIL function can be switched on and validated remotely via SIMATIC PDM. This eliminates travel times and on-site operation via the local display or keyboard.

Parameter assignment using the HART protocol is very easy and quick thanks to the innovative EDD with integrated Quick Start wizard.

The transmitters can be equipped with various types of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume flow
- Mass flow

Benefits

- Diagnostic functions in accordance with NAMUR recommendation NE107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability
- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

Application

SITRANS P320/P420 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads.

The pressure transmitters can be used in zone 1 or zone 0 with the corresponding Ex approval.

The pressure transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be operated locally over 4 input buttons or programmed externally over HART interface.

Pressure transmitters for gauge pressure

Measured variable:

- Gauge pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for absolute pressure

Measured variable:

- Absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 160 bar a (0.12 to 2 321 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative overpressure
- Flow q ~ √Δp (together with a primary differential pressure transducer (see section "Flowmeters"))

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 160 bar (0.0145 to 2 321 psi)

Pressure transmitters for level

Measured variable:

- Level of corrosive and non-corrosive liquids in open and closed vessels.

Measuring span (infinitely adjustable)

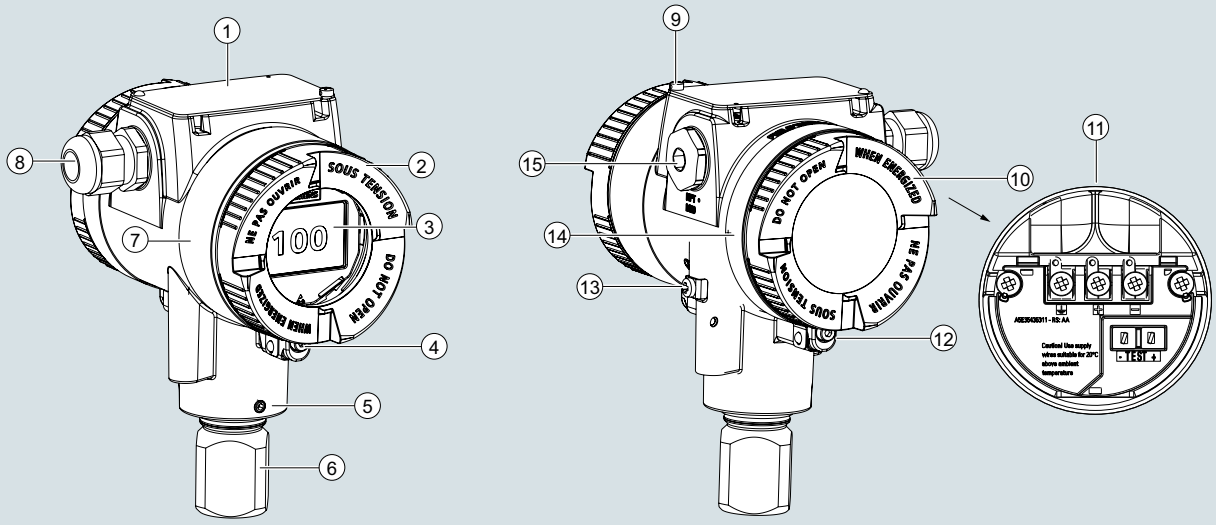
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

- EN 1092-1 flanges
- ASME B16.5 flanges
- J.I.S. flanges
- Diverse range of sealing surface forms available

Design

Depending on the customer-specific order, the device comprises different parts.



1. Cover over buttons and nameplate with general information
2. Cover (front) with glass pane (optional)
3. Display (optional)
4. Safety catch (front)
5. Locking screw for locking the enclosure
6. Process connection
7. Approval label with approval information
8. Cable inlet, optionally with cable gland
9. Locking screw for the cover over the buttons
10. Cover (rear) for electrical terminal compartment
11. Electrical terminal compartment
12. Safety catch (back)
13. Ground terminal
14. Nameplate with information on the remote seal
15. Blanking plug

Device front view

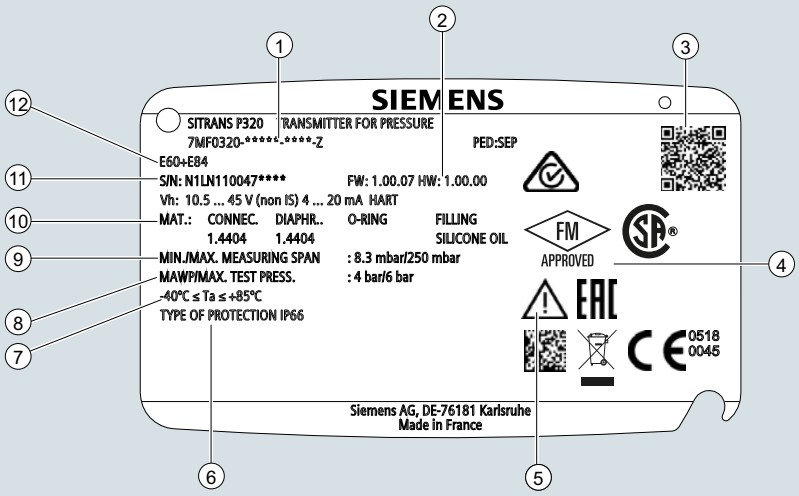
- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The enclosure has a removable cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed with a glass pane.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.
- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure.
  The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The button cover (1), is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

Technical description

Nameplates

Nameplate

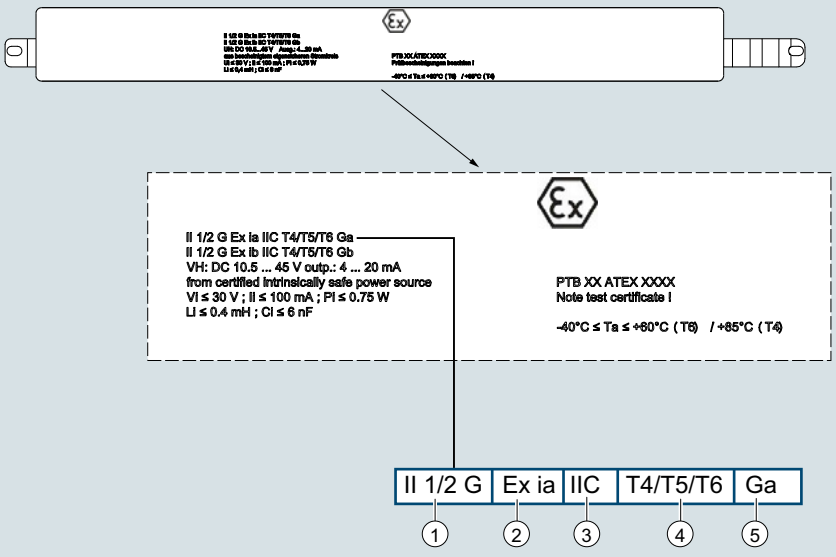
The nameplate with the article no. and other important information, such as design details and technical data, is located on the cover over the buttons.



1. Article number
2. Firmware and hardware identification
3. QR code to the mobile website with device-specific information
4. Conformity with country-specific directives
5. Note operating instructions, certificates and approvals
6. Protection class
7. Permitted ambient temperature for the hazardous area of the corresponding temperature class
8. Maximum allowable operating pressure / maximum allowable test pressure
9. Minimum/maximum measuring span
10. Material: connection, diaphragm, O-ring, oil
11. Serial number
12. Order supplement (options, order code)

Certification label with approval information

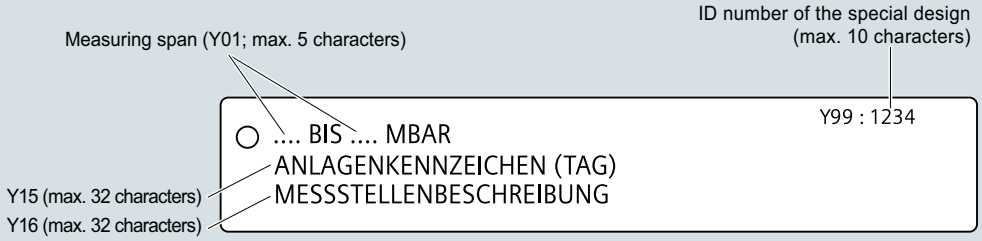
The certification label with approval information is located on the front of the enclosure.



1. Characteristics of the hazardous area
2. Type of protection
3. Group (gas, dust)
4. Maximum surface temperature (temperature class)
5. Device protection level

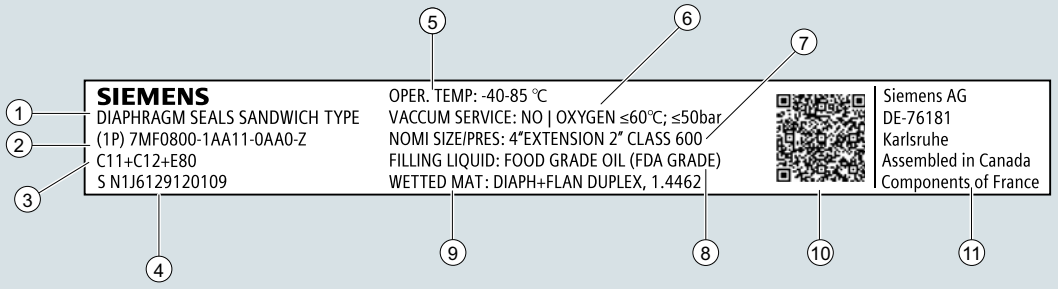
Tag plate

The tag plate is fastened with a wire under the front cover.



Nameplate with information on the remote seals

The nameplate with information on the remote seals is located on the back of the enclosure.



1. Diaphragm seals of sandwich type
2. Article number
3. Order supplement (options, order code)
4. Serial number
5. Operating temperature
6. Vacuum pressure service: No, oxygen ≤ 60 °C; ≤ 50 bar
7. Nominal diameter/pressure: 4 inch, 50 mm tube length, CLASS 600
8. Filling liquid: Food grade oil (FDA-compliant)
9. Wetted materials: Diaphragm duplex, 1.4462
10. QR code to mobile website with device-specific information
11. Assembly and manufacturing location

Function

Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

Parameters	Input buttons	SITRANS P320	SITRANS P420
Application, measurement type	x	x	x
Adjusting lower range value/upper range value	x	x	x
Setting lower range value/upper range value	x	x	x
Electrical damping	x	x	x
Zero adjustment	x	x	x
Fault current	x	x	x
Saturation limits	x	x	x
Scaling of the display	x	x	x
Characteristic curve selection	x	x	x
Temperature unit	x	x	x
Button lock	x	x	x
Change user PIN	x	x	x
Functional safety	x	x	x
Loop test	x	x	x
Start view	x	x	x
Pressure reference	x	x	x
Reset	x	x	x
Diagnostics and trend log			
Min/max pointer	–	x	x
Limit monitoring	–	2	2
Event counter (overrun/undershoot)	–	2	2
Maintenance and service timer	–	–	x
Trend log	–	–	2, max. 1 500 values
Diagnostic log	–	–	x
Parameters change log	–	–	x

Available physical units of display for SITRANS P320/P420

Physical variable	Physical units
Pressure (can also be preset in the factory)	Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Level (height data)	m, cm, mm, ft, in
Volumes (fill level)	m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl
Volume (flow)	m^3/sec, m^3/h, m^3/d, l/sec, l/min, l/h, Ml/d, ft^3/sec, ft^3/h, ft^3/d, SCF/min, SCF/h, Nl/h, Nm^3/hgal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK))/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d,
Mass (flow)	Kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d
Temperature	°C, °F
Other	%, mA, free text max. 12 characters

For more device information and technical specifications, refer to the individual device versions.

Technical specifications

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)

Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. permissible test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 … 3.6 psi	4 bar 0.4 MPa 58 psi	6 bar 0.6 MPa 87 psi
	0.01 ... 1 bar 1 ... 100 kPa 0.15 … 14.5 psi	6 bar 0.6 MPa 87 psi	9 bar 0.9 MPa 130 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 … 58 psi	20 bar 2 MPa 290 psi	30 bar 3 MPa 435 psi
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 … 232 psi	45 bar 4.5 MPa 652 psi	70 bar 7 MPa 1015 psi
	0.63 ... 63 bar 0.063 ... 6.3 MPa 9.1 … 914 psi	80 bar 8 MPa 1160 psi	120 bar 12 MPa 1740 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 … 2321 psi	240 bar 24 MPa 3481 psi	360 bar 36 MPa 5221 psi
	4 ... 400 bar 0.4 ... 40 MPa 58 … 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi
	7 ... 700 bar 0.7 ... 70 MPa 102 … 10153 psi	800 bar 80 MPa 11603 psi	800 bar 80 MPa 11603 psi
Measuring limits			
• Lower measuring limit	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA (factory preset to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for gauge pressure (pressure series)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)		
Measuring accuracy		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range	
• Linear characteristic curve		
- 250 mbar/25 kPa/3.6 psi	r ≤ 1.25:	≤ 0.075% (SITRANS P320) ≤ 0.065% (SITRANS P420)
	1.25 < r ≤ 30:	≤ (0.008 · r + 0.055)%
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
- 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	r ≤ 3: 3 < r ≤ 100:	≤ 0.075% (SITRANS P320) ≤ (0.005 · r + 0.05)% (SITRANS P320)
	r ≤ 5: 5 < r ≤ 100:	≤ 0.075% (SITRANS P420) ≤ (0.005 · r + 0.05)% (SITRANS P420)
Influence of ambient temperature in % per 28 °C (50 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r + 0.1)%	
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.025 · r + 0.125)%	
• 700 bar/70 MPa/10152 psi	≤ (0.08 · r + 0.16)%	
Long-term stability at ±30 °C (±54 °F)		
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r)% per year	
• 1 bar/100 kPa/14.5 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%	
• 700 bar/70 MPa/10152 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
Operating conditions	
Medium temperature	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert oil	
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +100 °C (-40 ... +212 °F)
- 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA-compliant oil	-10 ... +100 °C (14 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil for gauge pressure measuring cells: 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85°C (14 ... +185°F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	Approx. 1.8 kg (3.9 lb) with aluminum enclosure Approx. 3.8 kg (8.3 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Mounting bracket	Zinc-plated steel or stainless steel
Process connection	• Connection shank G1/2A according to EN 837-1 • Female thread ½-14 NPT • Male thread M20 x 1.5 and ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

for gauge pressure (pressure series)

Selection and ordering data

	Article No.
Pressure transmitters for gauge pressure (pressure series)	
SITRANS P320 ↗	**7MF030 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF040 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
250 mbar (3.6 psi)	**F**
1 000 mbar (14.5 psi)	**J**
4 000 mbar (58 psi)	**N**
16 bar (232 psi)	**Q**
63 bar (914 psi)	**T**
160 bar (2 321 psi)	**V**
400 bar (5 802 psi)	**W**
700 bar (10 153 psi)	**X**
Process connection	
Male thread M20 x 1.5	**B**
Male thread G½ (DIN EN 837-1)	**D**
Female thread ½-14 NPT	**E**
Male thread ½-14 NPT	**F**
Oval flange, mounting thread: $^{7}/_{16}$-20 UNF (IEC 61518)	**G**
Oval flange, mounting thread: M10 (DIN 19213)	**H**
Oval flange, mounting thread: M12 (DIN 19213)	**J**
Version for diaphragm seal pressure	**U**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**

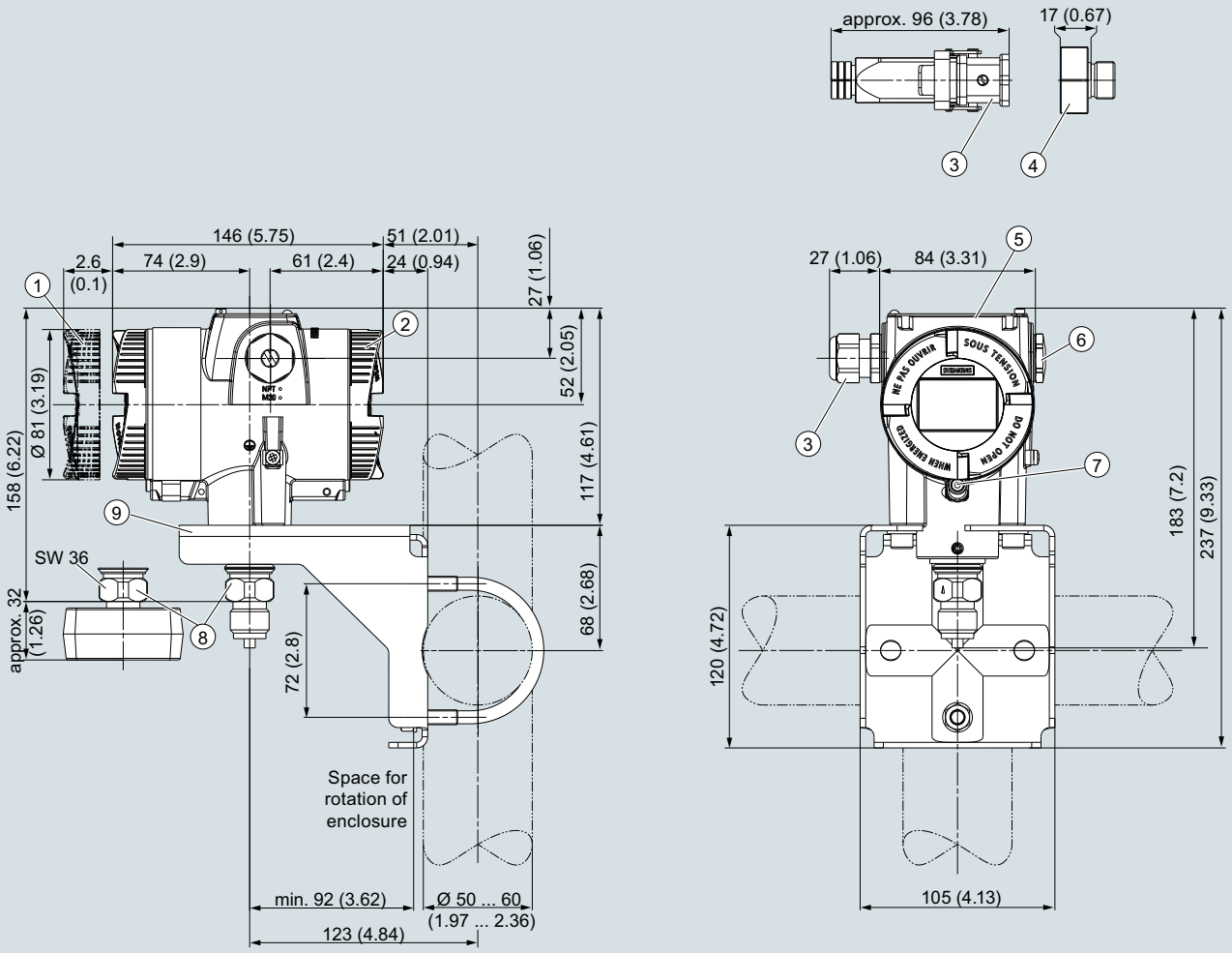
for gauge pressure (pressure series)

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Mounting bracket	
Steel, zinc-plated	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inH_g, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)			
Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 … 8.037 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 … 24.11 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 … 100.5 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 … 241.1 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1 600 mbar 1.6 ... 160 kPa 6.43 … 643 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5 000 mbar 5 ... 500 kPa 20.09 … 2 009 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 … 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	8 ... 160 bar 0.8 ... 16 MPa 116 … 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Conformity error at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range		
• Linear characteristic curve			
- 20 mbar/2 kPa/8.031 inH_2O	r ≤ 5:	≤ 0.075%	
	5 < r ≤ 20:	≤ (0.005 · r + 0.05)%	

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)		
- 60 mbar/6 kPa/24.09 inH_2O	r ≤ 5:	≤ 0.075%
	5 < r ≤ 60:	≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)%
Influence of ambient temperature in % per 28 °C (50 °F))		
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.15 · r + 0.1)%	
• 60 mbar/6 kPa/24.09 inH_2O	≤ (0.075 · r + 0.1)%	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)	
• 250 mbar/25 kPa/3.6 psi 5 000 mbar/500 kPa/2008 inH_2O	≤ (0.025 · r + 0.0625)% (SITRANS P420)	
• 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)	
Long-term stability at ±30 °C (±54 °F)		
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.2 · r)% per year	
• 60 mbar/6 kPa/24.09 inH_2O	In 5 years ≤ (0.25 · r)%	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%	
Step response time T_{63} (without electrical damping)		
• 20 mbar/2 kPa/8.031 inH_2O	Approx. 0.160 s	
• 60 mbar/6 kPa/24.09 inH_2O	Approx. 0.150 s	
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1 600 mbar/160 kPa/642.4 inH_2O 5 000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	Approx. 0.135 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature		
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)	
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)	
- Measuring cell 160 bar (2 320 psi)	-20 … +100 °C (-4 … +212 °F)	
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)	
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)	
Ambient conditions		
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)	
- Display	-20 … +80 °C (-4 … +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- According to NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.9 kg (13 lb) with stainless steel enclosure	
Material		
• Wetted parts materials		
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold	
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360	

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	¼-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values: U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values: U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

Communication

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

Selection and ordering data

	Article No.
Pressure transmitters for gauge pressure (differential pressure series)	
SITRANS P320 ↗	**7MF031 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF041 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
20 mbar (8.037 inH_2O)	**B**
60 mbar (24.11 inH_2O)	**D**
250 mbar (1005 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5 000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
160 bar (2 320 psi)	**Y**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M10 (PN 160), (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation	**P**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**4**
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**6**
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

for gauge pressure (differential pressure series)

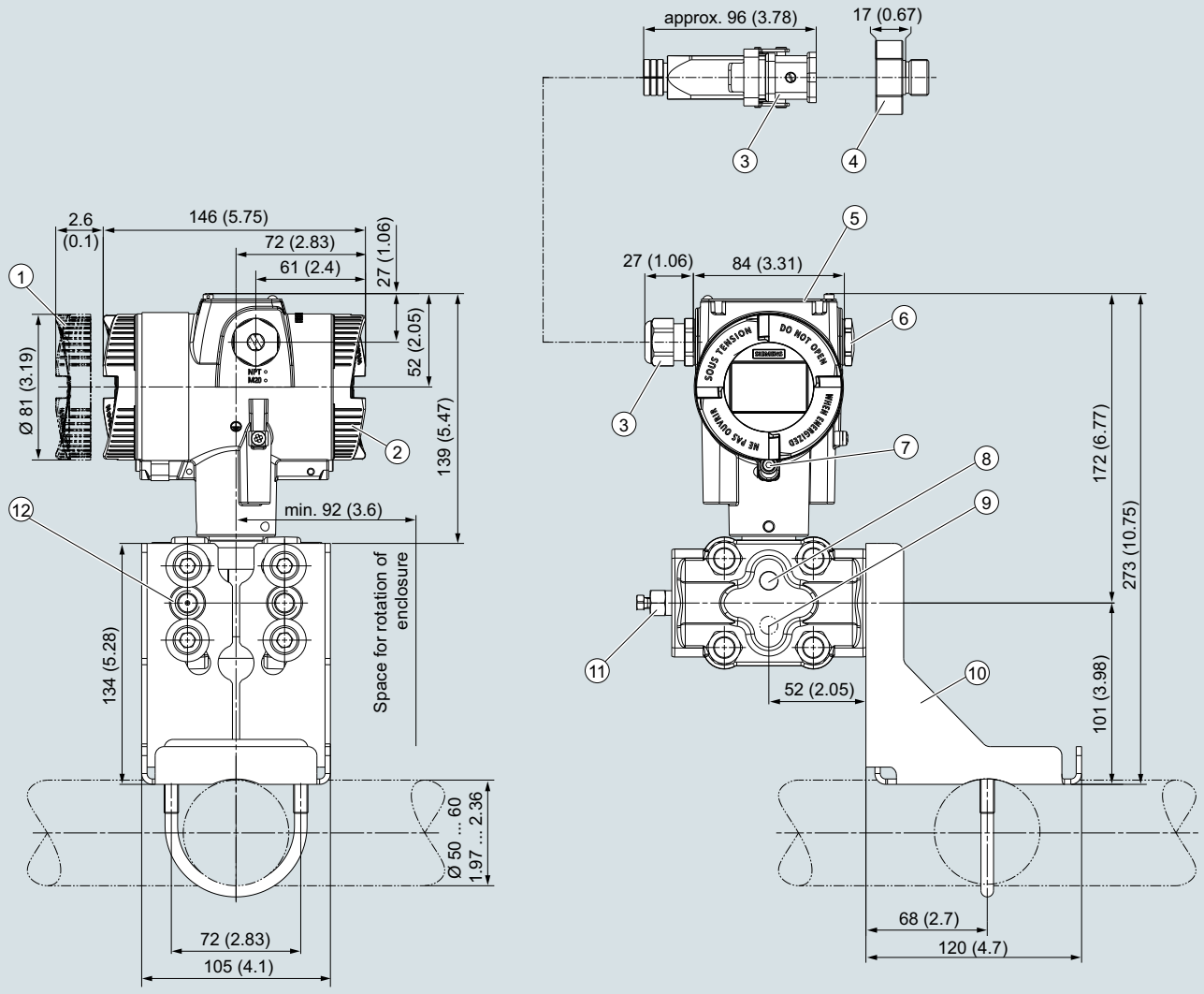
Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, zinc-plated	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange attached, PTFE seal + fastening screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (differential pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm			
Input of gauge pressure with front-flush diaphragm			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 … 14.5 psi	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	0.04 ... 4 bar 4 ... 400 kPa 0.58 … 58 psi		
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 … 232 psi		
	0.6 ... 63 bar 0.063 ... 6.3 MPa 9.1 … 914 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		
Input of absolute pressure, with flush-mounted diaphragm			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	43 … 1300 mbar a 4.3 ... 130 kPa a 17 … 525 inH_2O a	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	166 … 5000 mbar a 16.6 ... 500 kPa a 2.41 … 72.5 psi a		
	1 … 30 bar a 0.1 ... 3 MPa a 14.5 … 435 psi a		
	Depending on the process connection, the measuring span may differ from these values.		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 bar a/0 kPa a/0 psi a		
• Upper measuring limit	100% of max. measuring span		
Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for gauge and absolute pressure, flush-mounted diaphragm

SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm		
Gauge pressure measuring accuracy, with front-flush diaphragm		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic curve		
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.075% ≤ (0.005 · r + 0.05)%
Influence of ambient temperature in % per 28 °C (50 °F))		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	≤ (0.08 · r + 0.16)%	
Influence of the medium temperature (in pressure per temperature unit)		
• Temperature difference between medium temperature and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (±54 °F)		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	In 5 years ≤ (0.25 · r)%	
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	In 5 years ≤ (0.125 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Absolute pressure measuring accuracy with flush diaphragm		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic curve		
- All measuring cells	r ≤ 10: 10 < r ≤ 30:	≤ 0.2% ≤ 0.4%
Influence of ambient temperature in % per 28 °C (50 °F))		
• All measuring cells	≤ (0.16 · r + 0.24)%	
Influence of the medium temperature (in pressure per temperature unit)		
• Temperature difference between medium temperature and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (±54 °F)		
• All measuring cells	In 5 years ≤ (0.25 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm	
Operating conditions	
Medium temperature[2]	
• Measuring cell with silicone oil filling	-40 … +150 °C (-40 … +302 °F) -40 … +200 °C (-40 … +392 °F) with cooling extension
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with FDA-compliant oil	-10 … +150 °C (14 … 302 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert fill oil (different pressure classes)	1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 ps -40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85°C (14 ... +185°F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight (pressure transmitter without mounting flange)	Approx. 1.8 kg (3.5 lb) with aluminum enclosure Approx. 3.8 kg (8.3 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges • BioConnect/BioControl • PMC style
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[3] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)

SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm	
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa.
To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.

2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum medium temperature for flush-mounted process connections.

3) Han 8D is identical to Han 8U.

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Selection and ordering data

	Article No.
Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm	
SITRANS P320 for gauge pressure ↗	**7MF030 - ■■■■■ - ■■■■**
SITRANS P420 for gauge pressure ↗	**7MF040 - ■■■■■ - ■■■■**
SITRANS P320 for absolute pressure ↗	**7MF032 - ■■■■■ - ■■■■**
SITRANS P420 for absolute pressure ↗	**7MF042 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Neobee oil	**4**
Maximum measuring span	
1 000 mbar (14.5 psi)	**0 J**
4 000 mbar (58 psi)	**0 N**
16 bar (232 psi)	**0 Q**
63 bar (914 psi)	**0 T**
1 300 mbar a (18.9 psi a)	**2 L**
5 000 mbar a (72.5 psi a)	**2 P**
30 bar a (435 psi a)	**2 R**
Process connection	
Flush-mounted diaphragm	**K**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5 • 2 x ½-14 NPT	**F** **M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

for gauge and absolute pressure, flush-mounted diaphragm

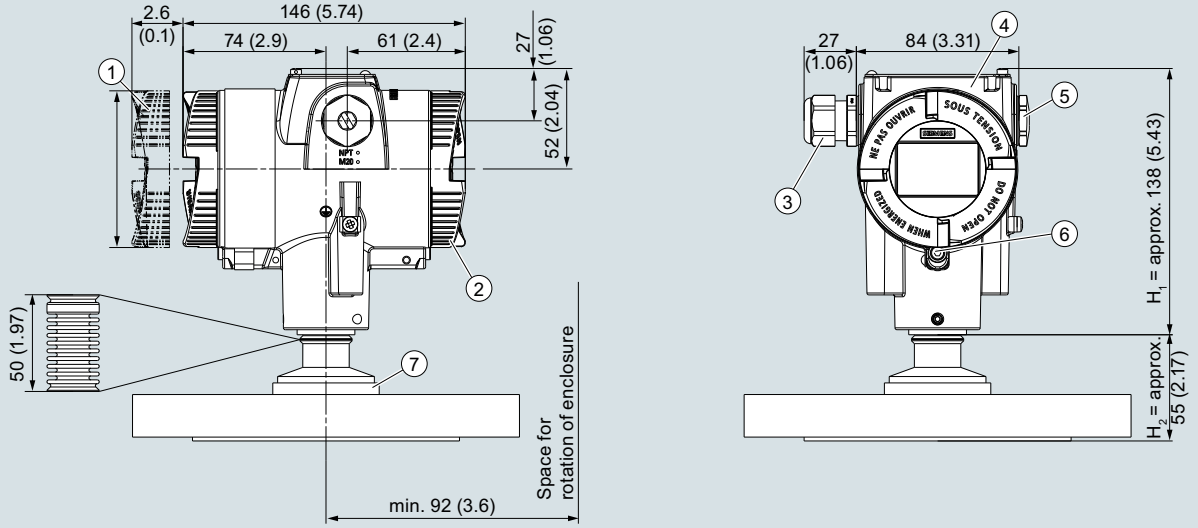
Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
3A (hygiene)	**E86**
EHEDG (hygiene)	**E87**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Flanges according to EN 1092-1 Form B1 and ASME standard B16.5	
EN 1092-1 Form B1	
• DN 50 PN 16	**M03**
• DN 80 PN 16	**M05**
• DN 25 PN 40	**M10**
• DN 40 PN 40	**M12**
• DN 50 PN 40	**M13**
• DN 80 PN 40	**M15**
• DN 40 PN 100	**M22**
ASME B16.5	
• 1" Class 150 RF	**M30**
• 1 ½" Class 150 RF	**M31**
• 2" Class 150 RF	**M32**
• 3" Class 150 RF	**M33**
• 4" Class 150 RF	**M34**
• 1 ½" Class 300 RF	**M36**
• 2" Class 300 RF	**M37**
• 3" Class 300 RF	**M38**
• 4" Class 300 RF	**M39**
Sanitary connections in accordance with the standard	
Sanitary flange DIN 11851	
• with slotted union nut DN 50 PN 25	**N03**
• with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp	
• DIN 32676 DN 50 PN 16	**N14**
• DIN 32676 DN 65 PN 10	**N15**
• ISO 2852 2" PN 40	**N22**
• ISO 2852 3" PN 40	**N23**
Aseptic threaded socket	
• DIN 11864-1 Form A DN 50 PN 25	**N33**
• DIN 11864-1 Form A DN 65 PN 25	**N34**
• DIN 11864-1 Form A DN 80 PN 25	**N35**
• DIN 11864-1 Form A DN100 PN 25	**N36**
Aseptic flange with notch	
• DIN 11864-2 Form A DN 50 PN 16	**N43**
• DIN 11864-2 Form A DN 65 PN 16	**N44**
• DIN 11864-2 Form A DN 80 PN 16	**N45**
• DIN 11864-2 Form A DN100 PN 16	**N46**
Aseptic clamp with groove	
• DIN 11864-3 Form A DN 50 PN 25	**N53**
• DIN 11864-3 Form A DN 65 PN 25	**N54**
• DIN 11864-3 Form A DN 80 PN 16	**N55**
• DIN 11864-3 Form A DN100 PN 16	**N56**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Sanitary connections manufacturer-specific	
Varivent type N for pipes DN 40 ... DN 125 PN 40	**P06**
Sanitary connections special design	
Tank connection	
• TG 52/50 PN 40 with seal	**Q00**
• TG 52/150 PN 40 with seal	**Q01**
DRD flange D = 65 mm DN 50 PN 40	**Q15**
SMS socket	
• with thread 2" PN 25	**Q28**
• with thread 2 ½" PN 25	**Q29**
• with thread 3" PN 25	**Q30**
Weldable sockets for tank connection	
Weldable piece for TG52/50	**Q90**
Weldable piece for TG52/150	**Q91**
Connections for the paper industry	
Process connection PMC Style Standard	**R00**
Process connection PMC Style Minibolt	**R01**
Weldable sockets for PMC Style Standard	**R02**
Weldable sockets for PMC Style Minibolt	**R03**
Threaded connection	
Male thread G¾-A DIN 3852	**R11**
Male thread G1-A DIN 3852	**R12**
Male thread G2-A DIN 3852	**R14**
Special options front-flush	
Temperature decoupler (media temperature up to 200 °C)	**R85**
Mating connector including seal	**R90**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Cover over buttons and nameplate
   with general information
5. Blanking plug
6. Safety catch
   (only for "flameproof enclosure" type of protection)
7. Process connection

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter, with flush-mounted diaphragm, dimensions in mm (inch)

This figure consists of a SITRANS P320/P420 with an example flange.
In this figure, the height is divided into H_1 and H_2.

H_1 = Height of the SITRANS P320P420 up to a defined cross-section

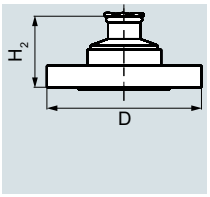
H_2 = Height of the flange up to this defined cross-section

Only the height H_2 is indicated in the dimensions of the flanges.

Flanges according to EN and ASME

Flange according to EN

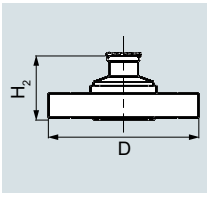
EN 1092-1



Order code	DN	PN	∅D	H_2
M03	50	16	165 mm (6.5 inch)	Approx. 52 mm (2 inch)
M05	80	16	200 mm (7.9 inch)	
M10	25	40	115 mm (4.5 inch)	
M12	40	40	150 mm (5.9 inch)	
M13	50	40	165 mm (6.5 inch)	
M15	80	40	200 mm (7.9 inch)	
M22	40	100	170 mm (6.7 inch)	

Flange according to ASME

ASME B16.5

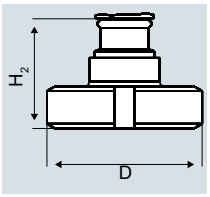


Order code	DN	Class	∅D	H_2
M30	1 inch	150	110 mm (4.3 inch)	Approx. 52 mm (2 inch)
M31	1½ inch	150	125 mm (4.9 inch)	
M32	2 inch	150	150 mm (5.9 inch)	
M33	3 inch	150	190 mm (7.5 inch)	
M34	4 inch	150	230 mm (9.1 inch)	
M36	1½ inch	300	155 mm (6.1 inch)	
M37	2 inch	300	165 mm (6.5 inch)	
M38	3 inch	300	210 mm (8.1 inch)	
M39	4 inch	300	255 mm (10.0 inch)	

NuG and pharmaceutical connections

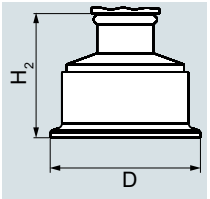
Connections to DIN

DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	∅D	H_2
N03	50	25	92 mm (3.6 inch)	Approx. 52 mm (2 inch)
N05	80	25	127 mm (5.0 inch)	

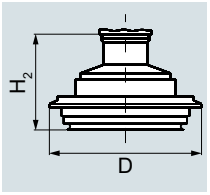
Tri-Clamp according to DIN 32676



Order code	DN	PN	∅D	H_2
N14	50	16	64 mm (2.5 inch)	Approx. 52 mm (2 inch)
N15	65	16	91 mm (3.6 inch)	
N22	2 inch	16	64 mm (2.5 inch)	Approx. 52 mm (2 inch)
N23	3 inch	10	91 mm (3.6 inch)	

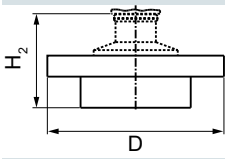
Other connections

Varivent connection



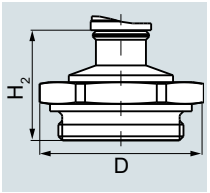
Order code	DN	PN	∅D	H_2
P06	40 ... 125	40	84 mm (3.3 inch)	Approx. 52 mm (2 inch)

Sanitary process connection according to DRD



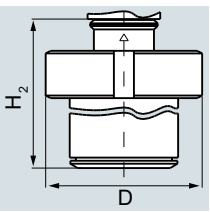
Order code	DN	PN	∅D	H_2
Q15	65	40	105 mm (4.1 inch)	Approx. 52 mm (2 inch)

Threaded connection G¾", G1" and G2" acc. to DIN 3852



Order code	DN	PN	∅D	H_2
R11	¾ inch	60	37 mm (1.5 inch)	Approx. 45 mm (1.8 inch)
R12	1 inch	60	48 mm (1.9 inch)	Approx. 47 mm (1.9 inch)
R14	2 inch	60	78 mm (3.1 inch)	Approx. 52 mm (2 inch)

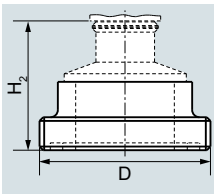
Tank connection TG 52/50 and TG52/150



Order code	DN	PN	∅D	H_2
Q00	25	40	63 mm (2.5 inch)	Approx. 63 mm (2.5 inch)
Q01	25	40	63 mm (2.5 inch)	Approx. 170 mm (6.7 inch)

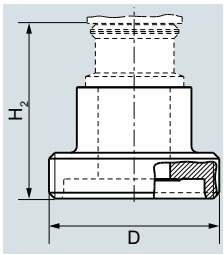
for gauge and absolute pressure, flush-mounted diaphragm

SMS threaded socket



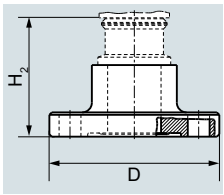
Order code	DN	PN	∅D	H_2
Q28	2 inch	25	70 x 1/6 mm	Approx. 52 mm (2.1 inch)
Q29	2½ inch	25	85 x 1/6 mm	
Q30	3 inch	25	98 x 1/6 mm	

Aseptic threaded socket according to DIN 11864-1 Form A



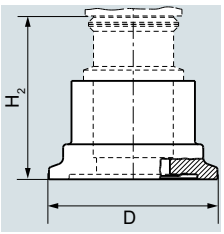
Order code	DN	PN	∅D	H_2
N33	50	25	78 x 1/6 inch	Approx. 52 mm (2.1 inch)
N34	65	25	95 x 1/6 inch	
N35	80	25	110 x ¼ inch	
N36	100	25	130 x ¼ inch	

Aseptic flange with notch to DIN 11864-2 Form A



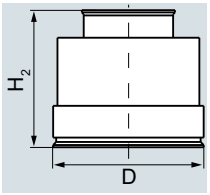
Order code	DN	PN	∅D	H_2
N43	50	16	94 (3.7 inch)	Approx. 52 mm (2.1 inch)
N44	65	16	113 (4.4 inch)	
N45	80	16	133 (5.2 inch)	
N46	100	16	159 (6.3 inch)	

Aseptic clamp with groove according to DIN 11864-3 Form A



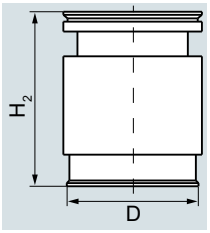
Order code	DN	PN	∅D	H_2
N53	50	25	77.5 (3.1 inch)	Approx. 52 mm (2.1 inch)
N54	65	25	91 (3.6 inch)	
N55	80	16	106 (4.2 inch)	
N56	100	16	130 (5.1 inch)	

Process connection PMC Style Standard



Order code	DN	PN	∅D	H_2
R00	-	-	40.9 mm (1.6 inch)	Approx. 36.8 mm (1.4 inch)

Process connection PMC Style Minibolt



Order code	DN	PN	∅D	H_2
R01	-	-	26.3 mm (1.0 inch)	Approx. 33.1 mm (1.3 inch)

Technical specifications

SITRANS P320/SITRANS P420 for absolute pressure (pressure series)

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 … 250 mbar a 0.83 ... 25 kPa a 3.3 … 100.5 inH_2O a	4 bar a 0.4 MPa a 58 psi a	6 bar a 0.6 MPa a 87 psi a
	43 … 1300 mbar a 4.3 ... 130 kPa a 17.3 … 522 inH_2O a	6.6 bar a 0.66 MPa a 95 psi a	10 bar a 1 MPa a 145 psi a
	166 … 5000 mbar a 16.6 ... 500 kPa a 2.41 … 72.5 psi a	20 bar a 2 MPa a 290 psi a	30 bar a 3 MPa a 435 psi a
	1 … 30 bar a 0.1 ... 3 MPa a 14.5 … 435 psi a	65 bar a 6.5 MPa a 942 psi a	100 bar a 10 MPa a 1450 psi a
	5.3 … 160 bar a 0.53 ... 16 MPa a 77 … 2321 psi a	240 bar 24 MPa 3481 psi	380 bar a 38 MPa a 5511 psi a
	13.3 … 400 bar a 1.3 ... 40 MPa a 192 … 5802 psi a	400 bar a 40 MPa a 5802 psi a	600 bar a 60 MPa a 8702 psi a
	23.3 … 700 bar a 2.3 ... 70 MPa a 337 … 10153 psi a	800 bar a 80 MPa a 11603 psi a	800 bar a 80 MPa a 11603 psi a
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert oil	For medium temperature -20-°C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation 0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA (factory preset to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld)) R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for absolute pressure (pressure series)

SITRANS P320/SITRANS P420 for absolute pressure (pressure series)	
Measuring accuracy	
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
• Linear characteristic curve (all measuring cells)	
- r ≤ 10	≤ 0.1%
- 10 < r ≤ 30	≤ 0.2%
Influence of ambient temperature (in % per 28 °C (50 °F))	
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1)%
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2321 psi a 400 bar a/40 MPa a/5802 psi a 700 bar a/70 MPa a/10153 psi a	≤ (0.08 · r + 0.16)%
Long-term stability at ±30 °C (±54 °F)	In 5 years ≤ (0.25 · r)%
Step response time T_{63} (without electrical damping)	Approx. 0.105 s
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero point correction is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Medium temperature	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert filling liquid	-40 … +85 °C (-40 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	Approx. 1.8 kg (3.9 lb) with aluminum enclosure Approx. 3.9 kg (8.3 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Mounting bracket	Zinc-plated steel or stainless steel
Process connection	• Connection shank G1/2A according to EN 837-1 • Female thread ½-14 NPT • Male thread M20 x 1.5 and ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12

SITRANS P320/SITRANS P420 for absolute pressure (pressure series)	
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

SITRANS P320/SITRANS P420 for absolute pressure (pressure series)	
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (pressure series)	
SITRANS P320 ↗	**7MF032 - □□□□□ - □□□□**
SITRANS P420 ↗	**7MF042 - □□□□□ - □□□□**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
250 mbar a (100.5 inH_2O a)	**F**
1 300 mbar a (522 inH_2O a)	**L**
5 000 mbar a (72.5 psi a)	**P**
30 bar a (435 psi a)	**R**
160 bar a (2 321 psi a)	**V**
400 bar a (5 802 psi a)	**W**
700 bar a (10 153 psi a)	**X**
Process connection	
Male thread M20 x 1.5	**B**
Male thread G½ (DIN EN 837-1)	**D**
Female thread ½-14 NPT	**E**
Male thread ½-14 NPT	**F**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**G**
Oval flange, mounting thread: M10 (DIN 19213)	**H**
Oval flange, mounting thread: M12 (DIN 19213)	**J**
Version for diaphragm seal pressure	**U**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

1

for absolute pressure (pressure series)

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

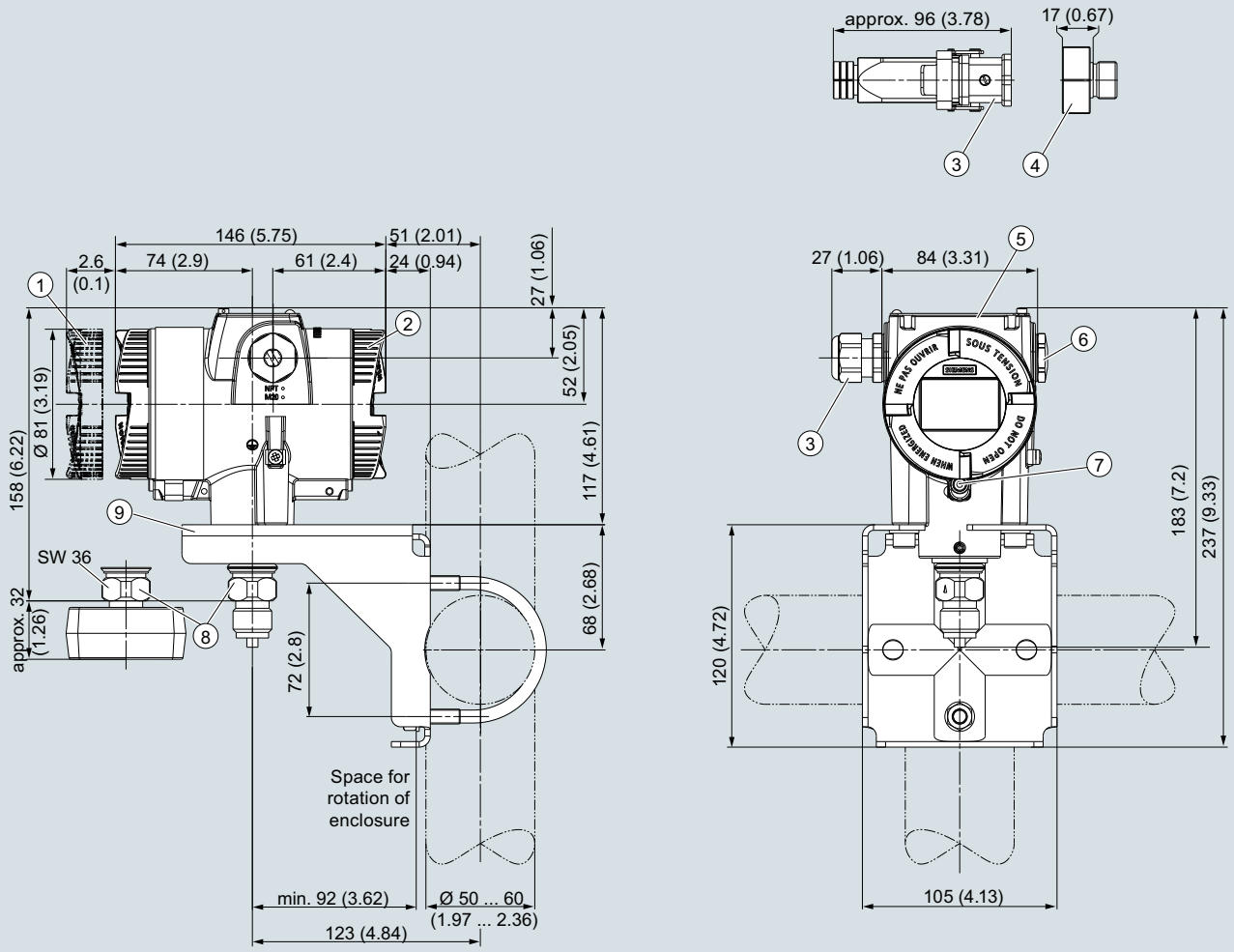
Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, zinc-plated	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, $inHg$, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 … 250 mbar a 0.83 ... 25 kPa a 3.3 … 100.5 inH_2O a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	43 … 1300 mbar a 4.3 ... 130 kPa a 17.3 … 522 inH_2O a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	166 … 5 000 mbar a 16.6 ... 500 kPa a 2.41 … 72.5 psi a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	1 … 30 bar a 0.1 ... 3 MPa a 14.5 … 435 psi a	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
	8 ... 160 bar 0.8 ... 16 MPa 116 … 2 320 psi	160 bar a 16 MPa a 2 320 psi a	240 bar a 24 MPa a 3 481 psi a
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert liquid	For medium temperature -20-°C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Conformity error at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range		

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)		
• Linear characteristic curve		
- 250 mbar/25 kPa/3.63 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 30:	≤ (0.02 · r + 0.05)%
- 1 300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a	r ≤ 5:	≤ 0.075%
	5 < r ≤ 30:	≤ (0.005 · r + 0.05)%
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 20:	≤ (0.005 · r + 0.05)%
Influence of ambient temperature (in % per 28 °C (50 °F))		
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.1 · r + 0.1)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	≤ (0.0025 · r + 0.125)%	
Long-term stability at ±30 °C (±54 °F)		
• 250 mbar a/25 kPa a/3.6 psi a	In 5 years ≤ (0.2 · r)%	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	In 5 years ≤ (0.1 · r)% In 10 years ≤ (0.15 · r)%	
Step response time T_{63} (without electrical damping)		
• 250 mbar a/25 kPa a/3.6 psi a 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	Every 0.135 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature		
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)	
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)	
- Measuring cell 160 bar (2 320 psi)	-20 … +100 °C (-4 … +212 °F)	
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)	
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)	
Ambient conditions		
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.	
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)	
- Display	-20 … +80 °C (-4 … +176 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))	
• Climatic class in accordance with IEC 60721-3-4	4K4H	
• Degree of protection		
- According to IEC 60529	IP66, IP68	
- According to NEMA 250	Type 4X	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure	
Material		
• Wetted parts materials		
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold	
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360	
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	
• Non-wetted parts materials		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)	
- Process flange screws	Stainless steel ISO 3506-1 A4-70	
- Mounting bracket	Steel, zinc-plated steel, or stainless steel	
Process connection	¼-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))	
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12	

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) Han 8D is identical to Han 8U.

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (differential pressure series)	
SITRANS P320 ↗	**7MF033 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF043 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
250 mbar a (100.5 inH_2O a)	**G**
1 300 mbar a (522 inH_2O a)	**L**
5 000 mbar a (72.5 psi a)	**P**
30 bar a (435 psi a)	**R**
160 bar (2 320 psi)	**Y**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**Q**
Oval flange, mounting thread: M10 (DIN 19213)	**R**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**S**
Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation	**T**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M10 (DIN 19213)	**W**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408	**4**
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408	**6**
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

for absolute pressure (differential pressure series)

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, zinc-plated	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

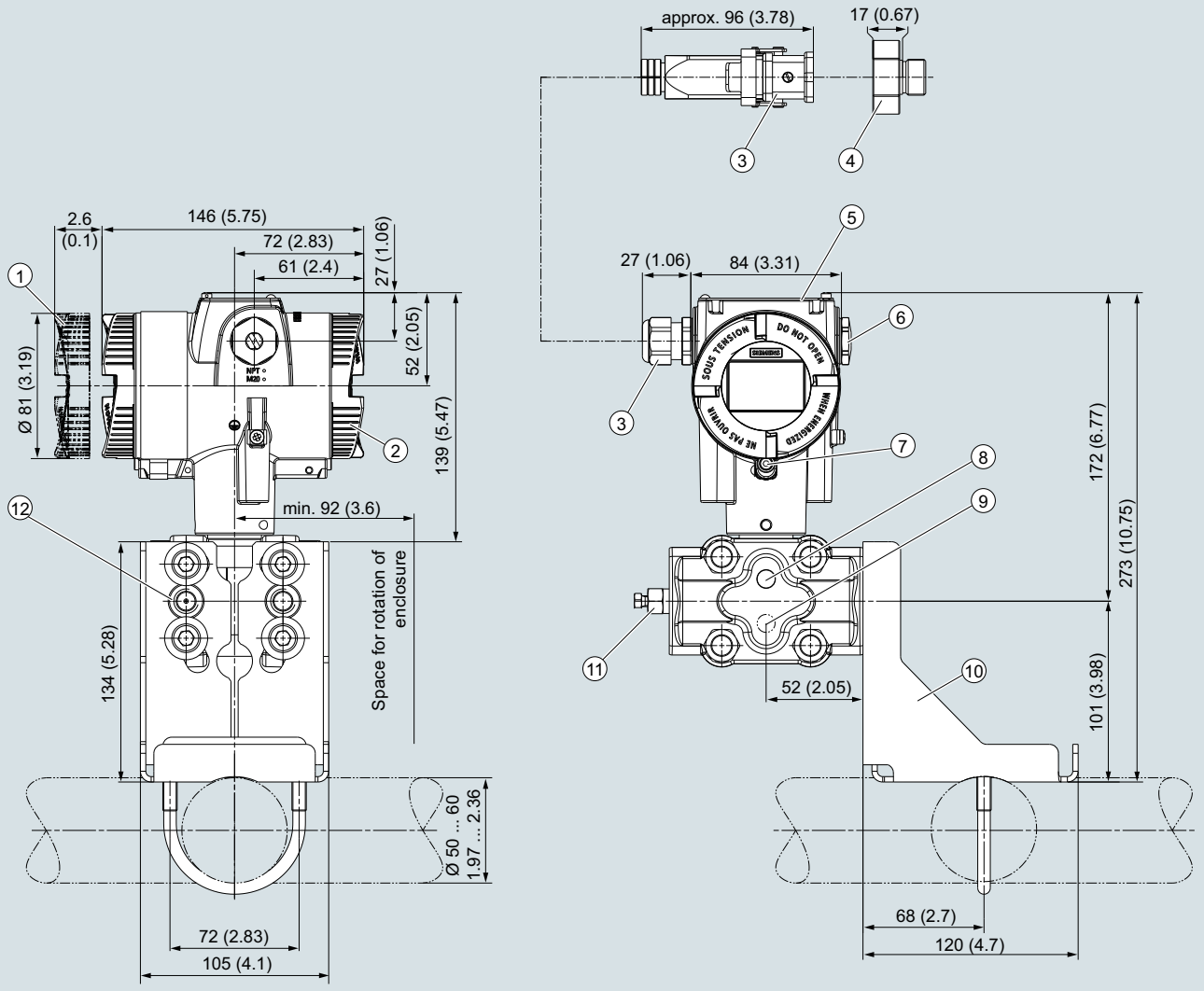
Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange attached, PTFE seal + fastening screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

for absolute pressure (differential pressure series)

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3)]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (differential pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow

Input

Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 … 8.037 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 … 24.11 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 … 100.5 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 … 241.1 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 … 643 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	50 ... 5000 mbar 5 ... 500 kPa 20.09 … 2009 inH_2O	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.08 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 … 435 psi	160 bar 16 MPa 2 320 psi	240 bar 24 MPa 3 481 psi
	2.5 ... 250 mbar 0.25 ... 25 kPa 1.005 … 100.5 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 … 241.1 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 … 643 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	50 ... 5000 mbar 5 ... 500 kPa 20.09 … 2009 inH_2O	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 … 435 psi	420 bar 42 MPa 6 092 psi	630 bar 63 MPa 9 137 psi

Measuring limits		
• Lower measuring limit		
- Measuring cell with silicone oil filling	All measuring cells: • -100% of max. measuring range or 30 mbar a /3 kPa a /0.44 psi a Measuring cell 160 bar/16 MPa/2 320 psi: • -25% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a	
- Measuring cell with inert liquid	For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a 30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
- Measuring cell with FDA-compliant oil	For medium temperature -10 °C < ϑ ≤ +100 °C (-14 °F < φ ≤ +212 °F)	-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	
• Lower range value	Between the measuring limits (infinitely adjustable)	

SITRANS P320 / SITRANS P420 for differential pressure and flow		
Output	**HART**	
Output signal	4 ... 20 mA	
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA	
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA	
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current	
Adjustable damping	0 … 100 s, continuously adjustable over remote operation	
	0 … 100 s, in increments of 0.1 s, adjustable over display	
• Current transmitter	3.55 … 22.8 mA	
• Failure signal	3.55 … 22.8 mA	
Load	Resistance R [Ω]	
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V	
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))	
	R = 230 … 500 Ω (SIMATIC PDM)	
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)	
Physical bus	-	
Polarity-independent	-	
Measuring accuracy		
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic curve		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 20:	≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 60:	≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.065% (SITRANS P320)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)% (SITRANS P320)
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.065% (SITRANS P320)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)% (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi (PN 160) 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)% (SITRANS P420)
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)% (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 420)	r ≤ 5:	≤ 0.065% (SITRANS P420)
• Square-rooted characteristic curve (flow > 50%)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 20:	≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5:	≤ 0.075%
	5 < r ≤ 60:	≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.004 · r + 0.045)%

SITRANS P320 / SITRANS P420 for differential pressure and flow		
• Square-rooted characteristic curve (flow 25 ... 50%)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5:	≤ 0.15%
	5 < r ≤ 20:	≤ (0.01 · r + 0.1)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5:	≤ 0.15%
	5 < r ≤ 60:	≤ (0.01 · r + 0.1)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5:	≤ 0.13% (SITRANS P320) ≤ 0.08% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.008 · r + 0.09)%
- 160 bar/16 MPa/2 320 psi	r ≤ 5:	≤ 0.13% (SITRANS P320) ≤ 0.08% (SITRANS P420)
	5 < r ≤ 20:	≤ (0.008 · r + 0.09)%
Influence of ambient temperature (in % per 28 °C (50 °F))		
- 20 mbar/2 kPa/0.29 psi	≤ (0.15 · r + 0.1)%	
- 60 mbar/6 kPa/0.87 psi	≤ (0.075 · r + 0.1)%	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)	
- 250 mbar/25 kPa/3.63 psi 5 bar/500 kPa/72.5 psi	≤ (0.025 · r + 0.0625)% (SITRANS P420)	
- 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)	
Effect of static pressure		
• At the lower range value	Zero-point correction is possible with position error compensation	
- 20 mbar/2 kPa/0.29 psi	≤ (0.3 · r)% per 70 bar (SITRANS P320) ≤ (0.2 · r)% per 70 bar (SITRANS P420)	
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ (0.1 · r)% per 70 bar	
- 5 bar/500 kPa/72.5 psi	≤ (0.15 · r)% per 70 bar	
• on the measuring span		
- 20 mbar/2 kPa/0.29 psi	≤ 0.2% per 70 bar	
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	≤ 0.1% per 70 bar	
Long-term stability at ±30 °C (±54 °F)	Static pressure max. 70 bar/7 MPa/1015 psi	
• 20 mbar/2 kPa/0.29 psi	≤ (0.2 · r)% per year	
• 60 mbar/6 kPa/0.87 psi	In 5 years ≤ (0.25 · r)%	
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 160 bar/16 MPa/2 320 psi	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%	
• 30 bar/3 MPa/435 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%	
Step response time T_{63} (without electrical damping for pressure rating PN 160)		
• 20 mbar/2 kPa/0.29 psi	Approx. 0.160 s	
• 60 mbar/6 kPa/0.87 psi	Approx. 0.150 s	
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	Approx. 0.135 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

SITRANS P320 / SITRANS P420 for differential pressure and flow	
Operating conditions	
Medium temperature	
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)
- Measuring cell 160 bar (2 320 psi)	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with FDA-compliant oil	-10 … +100 °C (14 … +212 °F)
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in hazardous areas.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Measuring cell with FDA-compliant oil	-10 … +85 °C (14 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.9 kg (13 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	¼-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6 092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–

SITRANS P320 / SITRANS P420 for differential pressure and flow	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
	For flow only
	For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To circuit with the operating values U_n = 10.5 ... 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Selection and ordering data

	Article No.
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	
SITRANS P320 ↗	**7MF034 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF044 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
20 mbar (8.037 inH_2O)	**B**
60 mbar (24.11 inH_2O)	**D**
250 mbar (100.5 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5 000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
160 bar (2 320 psi)	**Y**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation	**P**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M12 (PN 420) (DIN 19213)	**W**
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $^7/_{16}$-20 UNF (IEC 61518)	**X**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**4**
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**6**
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**

	Article No.
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	
SITRANS P320	**7MF034** ■ - ■■■■■ - ■■■■
SITRANS P420	**7MF044** ■ - ■■■■■ - ■■■■
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

1

for differential pressure and flow

	Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	
SITRANS P320 ↗	**7MF035 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF045 - ■■■■■ - ■■■■**
Click the article number for online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
250 mbar (100.5 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5 000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation	**P**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M10 (DIN 19213)	**W**
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $^7/_{16}$-20 UNF (IEC 61518)	**X**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Increase of pressure rating from PN 420 to PN 500 (Tested according to IEC 61010. Only permissible for process media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous process media.)	**D50**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

for differential pressure and flow

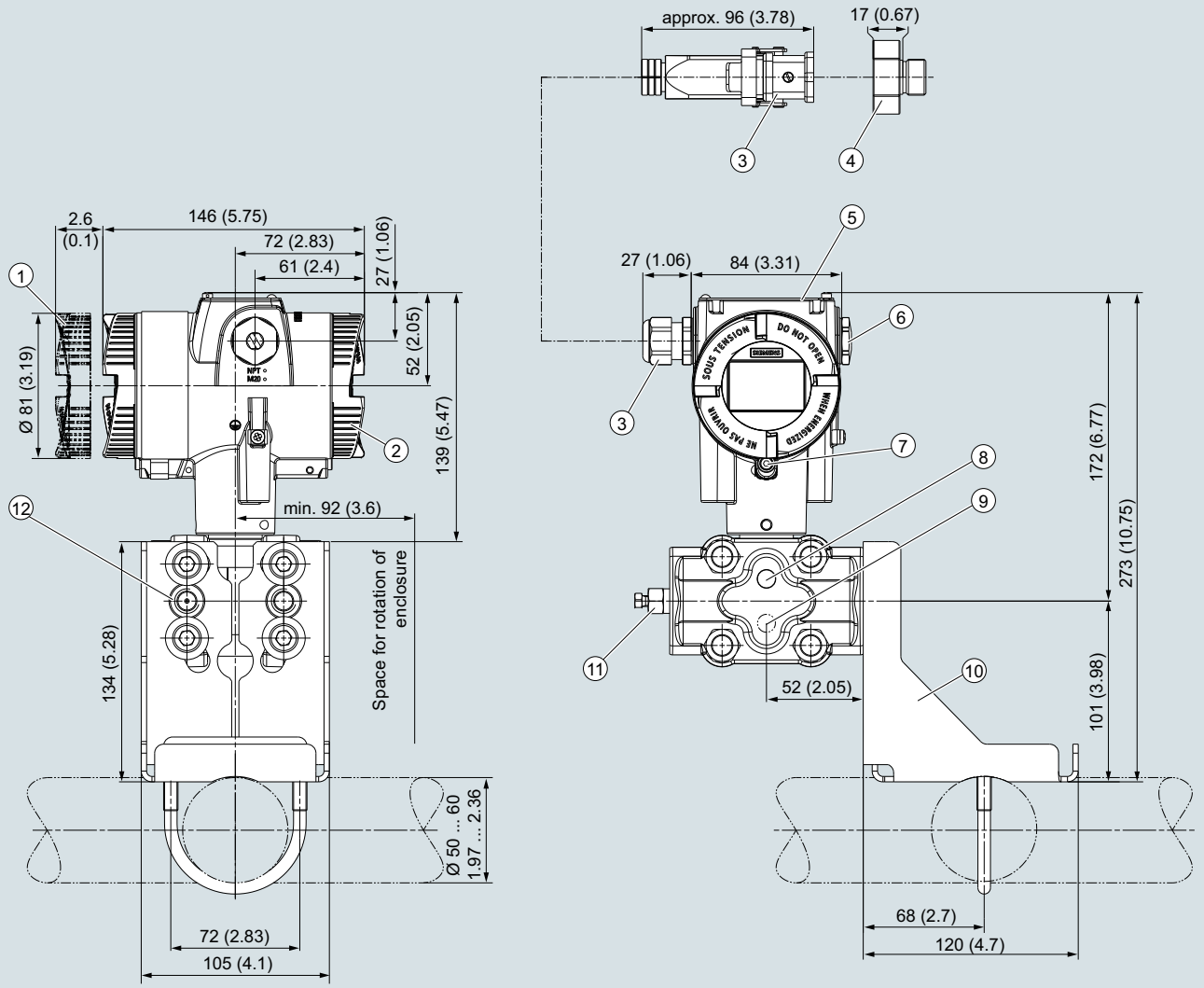
Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, zinc-plated	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange attached, PTFE seal + fastening screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH$_2$O, inH$_2$O (4°C), ftH$_2$O, mmH$_2$O, mmH$_2$O (4°C), mH$_2$O (4°C), mmHg, inHg, atm, torr	**Y01**
Square-rooted characteristic curve [VSLN2, MSLN2], example: VSLN2 Drop-down list: VSLN2, MSLN2	**Y02**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... . 5 m^3/s Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl, m^3/sec, m^3/h, m^3/d, l/sec, l/min, l/h, Ml/d, ft^3/sec, ft^3/h, ft^3/d, SCF/min, SCF/h, Nl/h, Nm^3/h, gal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d, kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

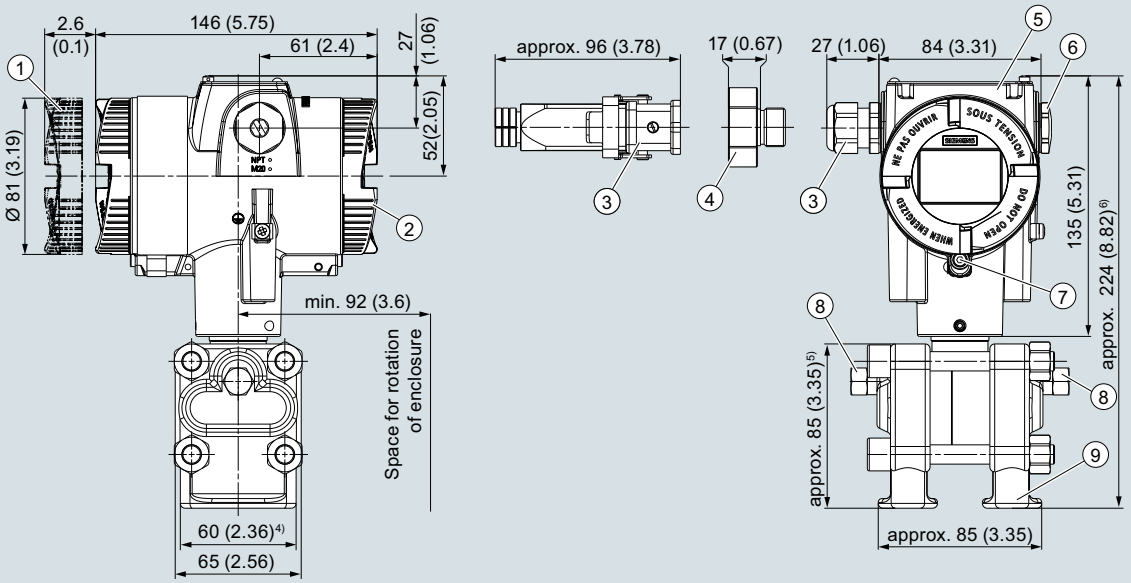
Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)



1. Electronics side, local display
   (longer overall length for cover with inspection window)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1.5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Harting adapter
5. Cover over buttons and nameplate
   with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Sealing plug with valve (option)
9. Process connection: ¼-18 NPT (IEC 61518)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"
4) 74 mm (2.9 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)
5) 91 mm (3.6 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)
6) 226 mm (8.9 inches) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P320/P420 pressure transmitter for differential pressure and flow with process covers for vertical differential pressure lines (option "K81"), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for level			
Input			
Measured variable	Level		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	25 ... 250 mbar 2.5 ... 25 kPa 10 … 100.5 inH_2O	See "Mounting flange"	
	25 ... 600 mbar 2.5 ... 60 kPa 10 … 241 inH_2O		
	53 ... 1600 mbar 5.3 ... 160 kPa 21 … 643 inH_2O		
	166 ... 5 000 mbar 16.6 ... 500 kPa 2.41 … 72.5 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with inert oil	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with FDA-compliant oil	-100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation 0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistance R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld)) R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		

SITRANS P320 / SITRANS P420 for level	
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
• Linear characteristic curve	
- 250 mbar/25 kPa/3.6 psi - 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi - 5 bar/500 kPa/72.5 psi	r ≤ 5: ≤ 0.125% 5 < r ≤ 10: ≤ (0.007 · r + 0.09)%
Influence of ambient temperature in % per 28 °C (50 °F))	
• SITRANS P320 - 250 mbar/25 kPa/3.6 psi - 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi - 5 bar/500 kPa/72.5 psi	≤ (0.025 · r + 0.125)%
• SITRANS P420 - 250 mbar/25 kPa/3.6 psi - 5 bar/500 kPa/72.5 psi	≤ (0.025 · r + 0.0625)%
- 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi	≤ (0.125 · r + 0.0625)%
Effect of static pressure	
• At the lower range value	
- 250 mbar/25 kPa/3.63 psi	≤ (0.3 · r) % per nominal pressure
- 600 mbar/60 kPa/8.7 psi 1.6 bar/160 kPa/23.21 psi 5 bar/500 kPa/72.52 psi	≤ (0.15 · r)% per nominal pressure
• on the measuring span	≤ (0.1 · r)% per nominal pressure
Long-term stability at ±30 °C (±54 °F)	
• all measuring cells	In 5 years ≤ (0.25 · r)% static pressure max. 70 bar/7 MPa/1015 psi
Step response time T_{63} (without electrical damping)	Depending on the installed remote seal
Influence of mounting position	Depends on the filling liquid in the mounting flange
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Medium temperature	
Measuring cell with silicone oil filling	• High side: See "Mounting flange" • Low side: -40 … +100 °C (-40 … +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Vibration resistance	
• Reference conditions	Specifications apply to devices without mounting bracket
• General operating conditions	
- Oscillations (sine) IEC 60068-2-6	10 ... 58 Hz, 0.3 mm (0.01 inch) 58 ... 500 Hz, 20 m/s² (65.62 ft/s²) 1 octave/min 5 cycles/axis
- Continuous shocks (half-sine) IEC 60068-2-27	250 m/s² (820 ft/s²) 6 ms 2000 shocks/axis
- Noise (digitally controlled) IEC 60068-2-64	10 ... 200 Hz; 1 (m/s²)²/Hz (3.28 (ft/s²)²/Hz) 200 ... 500 Hz; 0.3 (m/s²)²/Hz (0.98 (ft/s²)²/Hz) 4 hours/axle
• Operating conditions for marine applications	
- IEC 60068-2-6 - DNVGL-CG-0339, clause 6 - Lloyd's Register Test Specification Number 1, section 12. - Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7	2 ... 25 Hz, 1.6 mm (0.06 inch) 25 ... 100 Hz, 40 m/s² (131.23 ft/s²) 1 octave/min

for level

SITRANS P320 / SITRANS P420 for level		
Structural design		
Weight	Pressure transmitter with mounting flange, without tube	
• According to EN	• Aluminum enclosure: approx. 11 … 13 kg (24.2 … 28.7 lb) • Stainless steel enclosure: approx. 13 ... 15 kg (28.7 ... 33 lb)	
• According to ASME	• Aluminum enclosure: approx. 11 … 18 kg (24.2 … 39.7 lb) • Stainless steel enclosure: approx. 13 ... 20 kg (28.7 ... 44 lb)	
Material		
• Wetted parts materials		
- High side	Seal diaphragm of mounting flange	Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE
	Sealing surface	Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 … 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials
- Gasket material in the process flanges	For standard applications	Viton
	For negative pressure applications on the mounting flange	Copper
- Low side	Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
	Process flanges	Stainless steel, mat. no. 1.4408/316
	Process flange screw	Stainless steel ISO 3506-1 A4-70
	O-ring	FPM (Viton)
• Non-wetted parts materials		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L)	
Process flange screws	Stainless steel ISO 3506-1 A4-70	
Measuring cell filling	Silicone oil	
• Mounting flange filling liquid	Silicone oil or other material	
Process connection		
• High side	Flange according to EN and ASME	
• Low side	¼-18 NPT female thread and flange connection with M10 fastening screw thread according to DIN 19213 (M12 for PN 420 (MWP 6092 psi)) or 7/16-20 UNF according to EN 61518	
Electrical connection	Screw terminals	
	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12	
Displays and controls		
Buttons	4 buttons for operation directly on the device	
Display	• With or without integrated display (optional) • Lid with inspection window (optional)	
Auxiliary power U_H		
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod	
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)	
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)	
Auxiliary power	–	
Separate supply voltage	–	

SITRANS P320 / SITRANS P420 for level	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values U_n = 10.5 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

Mounting flange	
Nominal diameter	Nominal pressure
• Acc. to EN 1092-1	
- DN 80	PN 40
- DN100	PN 16, PN 40
• According to ASME B16.5	
- 3 inch	Class 150, class 300
- 4 inch	Class 150, class 300

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 … 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Selection and ordering data

	Article No.
Pressure transmitters for level	
SITRANS P320 ↗	**7MF036 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF046 - ■■■■■ - ■■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
PROFIBUS PA	**1**
FOUNDATION Fieldbus (FF)	**2**
Measuring cell filling	
Silicone oil	**1**
Maximum measuring span	
250 mbar (100.5 inH_2O)	**G**
600 mbar (241 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5 000 mbar (72.5 psi)	**P**
Process connection	
Version for diaphragm seal with fastening thread $^7/_{16}$-20 UNF (IEC 61518): Remote seal 7MF0814 must be ordered separately.	**V**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (lid closed)	**0**
With display (lid closed)	**1**
With display (lid with glass pane)	**2**

for level

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
Unlabeled TAG plate	**D40**
Without labeling of the measuring range on the TAG plate	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (internal)	**D70**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)[1)]	**E21**
FM (USA and Canada)[1)]	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)[1)]	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)[1)]	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual Seal	**E81**
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Set PROFIBUS PA device address (1 ... 126)	**Y25**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

[1] Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

for level

		Article No.	Order-code
Diaphragm seal ↗		7MF0814-	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		■■■03-0■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Standard of process connection EN 1092-1			
Nominal diameter	**Nominal pressure**		
DN 40	PN 10/16/25/40	0DD	
	PN 63/100	0DF	
	PN 160	0DG	
DN 50	PN 10/16/25/40	0ED	
	PN 63/100	0EE	
	PN 160	0EF	
DN 80	PN 10/16/25/40	0GD	
	PN 100	0GF	
DN 100	PN 10/16	0HB	
	PN 25/40	0HD	
DN 125	PN 16	0JB	
	PN 40	0JD	
Standard of process connection ASME B16.5			
Nominal diameter	**Nominal pressure**		
1½ inch	Class 150	1LA	
	Class 300	1LB	
	Class 400/600	1LD	
	Class 900/1500	1LF	
2 inch	Class 150	1MA	
	Class 300	1MB	
	Class 400/600	1MD	
	Class 900/1500	1MF	
3 inch	Class 150	1PA	
	Class 300	1PB	
	Class 600	1PD	
	Class 1500	1PF	
4 inch	Class 150	1QA	
	Class 300	1QB	
	Class 400	1QD	
	Class 1500	1QF	
5 inch	Class 150	1RA	
	Class 300	1RB	
	Class 400	1RC	
Process connection standard J.I.S.			
Nominal diameter	**Nominal pressure**		
DN 50	10K	2ES	
	20k	2ET	
	40K	2EU	
DN 80	10K	2GS	
	20k	2GT	
	40K	2GU	
DN 100	10K	2HS	
	20k	2HT	
	40K	2HU	
Other version Add order code and plain text.		9ZA	H1Y

	Article No.	Order-code
Diaphragm seal	7MF0814-	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit	■■■03-0■■	■■■
Filling liquid		
Silicone oil M50	B	
High-temperature oil	C	
Silicone oil M5	A	
Food oil (FDA-listed)	E	
Halocarbon oil	D	
Other version Add order code and plain text.	Z	P1Y
Wetted parts materials		
316L stainless steel		
• Without coating	A	
• With PFA coating	D	
• With PTFE coating	E	0
• With ECTFE coating	F	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Titanium, 3.7035	L	0
Nickel 201	M	0
Diaphragm Duplex, 1.4462	Q	
Diaphragm and flange Duplex, 1.4462	R	
Stainless steel 316 with gold coating	S	0
Hastelloy C4, 2.4610	U	0
Hastelloy C22, 2.4602	V	0
Other version Add order code and plain text.	Z	Q1Y
Tube length		
None	0	
50 mm (2 inch)	1	
100 mm (4 inch)	2	
150 mm (6 inch)	3	
200 mm (8 inch)	4	
250 mm (10 inch)	5	
Other version Add order code and plain text.	Z8	R1Y

	Article No.	Order-code
Diaphragm seal In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit	**7MF0814-**	
	03-0	
Customer-specific tube length		
• Wetted parts: Stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**A1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**A2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**A3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**A4**
201 ... 250 mm (7.91 ... 9.84 inch) / 250 mm (9.84 inch)		**A5**
• Wetted parts: Stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**F1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**F2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**F3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**F4**
201 ... 250 mm (7.91 ... 9.84 inch) / 250 mm (9.84 inch)		**F5**
• Wetted parts: Stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**D1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**D2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**D3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**D4**
201 ... 250 mm (7.91 ... 9.84 inch) / 250 mm (9.84 inch)		**D5**
• Wetted parts: Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**G1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**G2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**G3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**G4**
• Wetted parts: Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**J1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**J2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**J3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**J4**

	Article No.	Order-code
Diaphragm seal In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit	**7MF0814-**	
	03-0	
• Wetted parts: Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97 inch) / 50 mm (1.97 inch)		**K1**
51 ... 100 mm (2.01 ... 3.94 inch) / 100 mm (3.94 inch)		**K2**
101 ... 150 mm (3.98 ... 5.91 inch) / 150 mm (5.91 inch)		**K3**
151 ... 200 mm (5.94 ... 7.87 inch) / 200 mm (7.87 inch)		**K4**

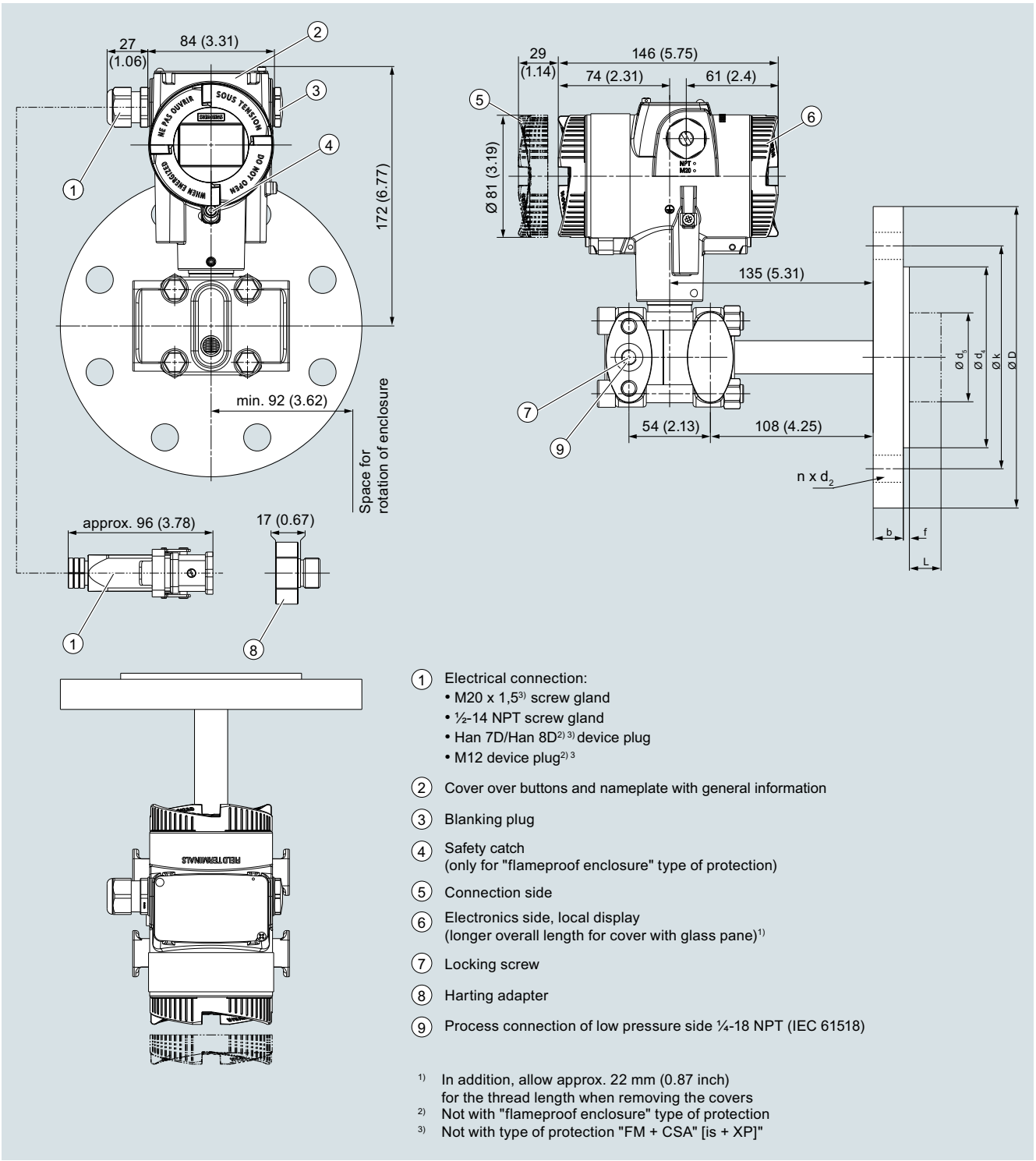
for level

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Factory certificates	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	**C11**
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	**C12**
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	**C15**
Test report on the FDA listing of the oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL declaration of conformity)	**C20**
Accessories	
Epoxy resin coating	**D15**
Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. • Not possible with negative pressure service	
Remote seal nameplate	**D42**
Attached, made of stainless steel, contains Article No. and order number of the remote seal	
Volume deflagration flame arrester (VDEF) for differential pressure transmitter	**D62**
Negative pressure service	
Negative pressure service for differential pressure transmitters	**D83**
Extended negative pressure service for differential pressure transmitters	**D88**
Approvals and certificates	
Country-specific approval CRN approval Canada (Canadian Registration Number)	**E60**
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	
Oil-free and grease-free cleaned version for oxygen application including EN 10204-2.2 certificates (only with filling liquid halocarbon oil and at max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-free and grease-free cleaned version not for oxygen application, including EN 10204-2.2 certificates (only with filling liquid halocarbon oil)	**E87**

Options	Order code
Add **"-Z"** to article number, specify order code and plain text or entry from drop-down list.	
Sealing surface	
Sealing surface smooth, Form B2/EN1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	**M50**
Sealing surface groove according to EN 1092-1, Form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	**M54**
Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	**M64**
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface male face according to EN 1092-1, Form C (only for wetted parts made of stainless steel 316L)	
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface female face according to EN 1092-1, Form F (only for wetted parts made of stainless steel 316L)	
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Remote seal connection	
Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	**S05**
Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	**S06**
Desired remote seal supplier	
Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Company WIKA, Klingenberg	**W01**
Company Labom, Hude	**W02**
Special design	
Welded filling hole	**X01**
Customer-specific tube length	
Customer-specific tube length (specify in plain text in mm)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

[1)] See also "Specification of process conditions for selection and ordering data" page 1/337.

Dimensional drawings



1. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
2. Cover over buttons and nameplate with general information
3. Blanking plug
4. Safety catch
   (only for "flameproof enclosure" type of protection)
5. Connection side
6. Electronics side, local display
   (longer overall length for cover with glass pane)[1]
7. Locking screw
8. Harting adapter
9. Process connection of low pressure side ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for level, including mounting flange, dimensions in mm (inch)

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M Without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/ 25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/ 25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/ 25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M Without tube	f	k	n	L
	lb/sq.in.	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

Process connection according to J.I.S

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M Without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of seal according to DIN 2690

d_M: Effective diaphragm diameter